

Solutions to Quiz 2, Unit 7.3

These questions concern the Hénon map,

$$x_{n+1} = y_n + 1 - ax_n^2, \quad (1)$$

$$y_{n+1} = bx_n. \quad (2)$$

1. If $a = 0.2$ and $b = 0.5$, what is the long-term behavior of the orbits?
 - A. The orbit approaches a fixed point.
 - B. The orbit approaches a cycle of period two.
 - C. The orbit approaches a cycle of period four.
 - D. The orbit does not appear to be periodic.

Solution: The correct answer is **B**.

2. If $a = 1.25$ and $b = 0.3$, what is the long-term behavior of the orbits?
 - A. The orbit approaches a fixed point.
 - B. The orbit approaches a cycle of period five.
 - C. The orbit approaches a cycle of period seven.
 - D. The orbit does not appear to be periodic.

Solution: The correct answer is **C**.

3. If $a = 1.4$ and $b = 0.3$, what is the long-term behavior of the orbits?
 - A. The orbit approaches a fixed point.
 - B. The orbit approaches a cycle of period five.
 - C. The orbit approaches a cycle of period seven.
 - D. The orbit does not appear to be periodic.

Solution: The correct answer is **D**.